PROCESSING OF WASTE BANKS BY THE SINTERING

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Many types of wastes are not enough studied, for them the rational methods of utilization are not developed, potential users are not definite. To such wastes it is possible to deliver the waste banks of Donbass coal mines.

On Donbass territory the thousand of dumps of coal mines is counted more than 1.5, in each of them there are on the average 1144 m^3 of rocks. Waste banks are sparse on all Donetsk territory on an area 8 mln m^2.

Confessedly, that maximal influence on surrounding an environment and, foremost, on composition to the atmosphere, coal dumps are rendered in the period of the flaming burning, which lasts to 30 years. From 111 Donbass dumps burn more than 60, contaminating air by the troop landing of dust, CO, H_2S and SO_2.

The executed researches of chemical composition of row of pedigree dumps of mines in Donetsk region give the pictures of chemical composition of waste banks. It turned out, that in waste banks are contained not only toxic, but also potentially valuable chemical elements. A breed contains the promoted quantity of coal - from 23 to 46%, and also raw material for production of aluminium - Al_20_3 (to 15 %) and germanium (to 55 g/t). A bulk is made by the oxides of silicon and iron (SiO2-47 %, Fe2O3-20 %), alkaline components - CaO and MgO do not exceed 5%. From these data it is possible to set the following directions of development of pedigree dumps:

1. Bauxites and aluminium alloys production.

There is economic feasibility of selection of bauxites, from the unburnt dumps with the simultaneous rise of their concentration from 14,9 to 40 – 50 % and subsequent transmission on an aluminium combine recipient bauxites from foreign distant.

However the way of direct production from the untraditional resources of aluminium alloys is more perspective. In this case smelting of directly dural alloys within the framework of production is carried out and the lowered power-cost expenditures. So, for example, at simultaneous reduction of ecological danger of production, labour productivity on such mini-plants in 2-3 times is higher, and specific capital investments in 3-4 times are below, than on the enterprises of traditional type. Estimations show that the equipment in this case is a model and small, that allows placing a technological complex with annual productivity a 20-25 thousand of t, the finished products in easy building by an area to 2000 m^2.

2. The chamber of magnetic ferrous containing connections from pedigree dumps.

Initial raw material contains over 20% oxides of iron in different connections. It is most simple to produce the initial selection of them by magnetic separators.

With the purpose of practical verification of electromagnetic separators possibility is the division of initial raw material at tension of the field about 900 ersted. Thus from 20,97% oxides of iron was at once withdrawn 14,4% or only 68,5% from all present. The sizes of extractive pieces achieved 31,4 mm, and mass – 19. Simultaneously there was similarly the rise of concentration of germanium in an initial product. Thus, keeping still a reserve on tension of the field in 3,9 times, it is possible to consider that in production the indicated task of some problems will not make.

3. Allocation germanium from pedigree dumps.

Extraction of germanium from containing him raw material can be carried out to one of three methods. First, most stand, consists of translation of raw material in solution with the subsequent use of oak concentrate. However the verification of the indicated method, executed at the coke plant having an of many years experience of a similar technology, as it applies to the given raw material, did not allow to get step of concentration of germanium in the processed product. By the second

method providing the selection simultaneously, except for a germanium, other rare earth elements, there is application of electrostatic separations. The common quantity of extractive rare elements by such method makes the no less than six.

4. Allocation rare earth elements from pedigree dumps.

Judging on results the analysis of coals which the considered breed accompanies to, in the given array will be in a sufficient for extraction quantity the gallium (Ga), how a concomitant to the germanium element, yttrium (I), zirconium (Zg) and scandium, is (Ss). Thus gallium is expected in a quantity approximately 100 g/t, (extraction expediently with 10 g

Utilization of them in sinter production is another method of utilization of wastes of the coal mining. As a result of sinterin/t), scandium is expected in quantities approximately 10-20 g/t (extraction expediently since 10 g/t). A common quantity in the breed of rare earth elements makes approximately 230-260 g/t).

5. Receipt of agloporite from pedigree dumps.g we get the porous matter – agloporite. Which in future can be used in building industry.

Thus, the offered technological chainlet will allow to get the following materials and components from pedigree dumps: iron ore, dural alloys and wares from them, germanium, rare earth elements, coal, silicate materials for build purposes.

The using of the offered complex technology of processing of pedigree dumps, besides an economic effect, will allow to decide the important ecological problem of elimination of pedigree dumps and rekultivatsii of the freed earth.